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ABSTRACT

Seven characteristics of the learning disabled child are described and suggestions to remediate these problems, from the viewpoint of an occupational therapist, are provided. Following are the seven areas (with sample teaching suggestions in parentheses): (1) tactile defensiveness (encourage children to use sand, clay, and finger paint with sawdust mixed into it): (2) apraxia (provide opportunities to plan movements, such as action songs): (3) vestibular problems (use recess for balance activities such as hopping, skipping, or rope jumping): (4) deficient bilateral integration (have children sort or classify objects into boxes across the midline): (5) deficient eye-hand coordination (teach self help skills like tying shoes, zipping, or pouring a drink): (6) deficient form and space perception (teach children to cover up part of a confusing worksheet so s/he can deal with one part at a time): and (7) language disorders (treat the vestibular problem, as this often affects the language processing problem). (PHR)

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TEACHERS AND OCCUPATIONAL THERAPISTS: PARTNERSHIP FOR CHILDREN WITH SPECIAL NEEDS
The Learning Disabled

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This paper will first outline the distinguishing characteristics of the learning disabled (LD) child. Then will be described the research basis by which occupational therapists have developed evaluation tools and treatment programs aimed specifically at the learning disabled. An explanation of some of the basic neurophysiological assumptions of this approach will be given as well as specific classroom recommendations for use by teachers.

The L D child is one type of student which can benefit from the unique services of the occupational therapist. This child has normal intelligence, no gross abnormalities in physical appearance and no major sensory impairments such as blindness, or deafness. Therefore the child's problems are subtle and difficult to diagnose and help. Sometimes hyperactive, distractible behavior is the most obvious deterrent to academic learning, but the behavior is not severe enough to be considered an emotional disturbance. The child may have difficulty with visual perception or language processing. Minimal signs of brain injury may be present and may

negatively effect fine motor skills and certain gross motor abilities in addition to other academic skills.

Evaluation and treatment procedures used by occupational therapists for the subtle problems of the learning disabled have developed from many sources. From treatment of the physically handicapped and mentally retarded came emphasis on activities of daily living, reflex inhibition and developmental balance skills with major contributions by the Bobaths, Rood and Fiorentino. From psychiatry came familiarity with psycho-social development. From the perceptual motor theories of Hebb, Kephart, Cratty, Barsch and Frostig came treatment ideas, but also an awareness of the limitations of their programs as pointed out by research in the late 1960's and early 1970's. Then a battery of tests and series of treatment procedures was developed by A. Jean Ayres (1) specifically to augment occupational therapy treatment of the learning disabled. Her theories will be described.

In factor analytic studies beginning about 15 years ago, Ayres studied correlatious between L D children's results in tests of visual perception, gross and fine motor control, eye movements, touch and laterality. She looked at patterns of low scores that tended to group together and developed hyphotheses about underlying neurological constructs. Simultaneously she developed and standardized the Southern California Sensory Integration Tests (2). Her hypotheses were further tested by clinical application and she

developed treatment techniques called sensory integration. These techniques are widely used by occupational therapists today for L D children as well as other handicapped individuals. Resulting improvement has been documented in gross and fine motor control and behavior. One goal is to reduce cognitive effort for these things so children are more ready to participate in classroom tasks. In efficacy studies Ayres even documented that sensory integration with L D children improved language skills (3) and academic scores (3,4) when compared with control students receiving just special education.

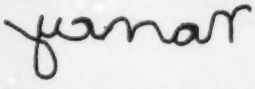
Ayres' studies pointed to 2 portions of the central nervous system that frequently appear to function inadequately in the L D population--the tactile system and the vestibular system. Bauer (5), Ottenbacher (6) and deQuiros (7) agreed. Some studies by Ayres (1), deQuiros (8) and Frank and Levinson (9) suggest that problems in these 2 systems may even contribute toward causing the learning disorder.

Tactile Defensiveness. The tactile system is responsible for our interpretation of touch and pressure to the skin. In the beginning of our life this system is well developed for protection — telling if things are good or bad, threatening or non threatening. As we grow, the second part of the tactile system developes more capability--that is,the discriminitive part. We learn to tell the difference in things spatially and temporally through the skin. If

the discriminative part of the tactile system developes inadequately and the protective part continues to dominate behavior we often see a child who is tactually defensive, i.e. easily frightened or distracted by unexpected touch. This child has trouble standing in line if he is accidentally bumped into. Out of seat behaviors may be precipitated by the discomfort of feeling the chair back or seat. The reward of a teacher's light pat on the shoulder may feel threatening.

Here are some things the teacher can do to help reduce hyperactivity and increase attention in the tactually defensive child: apply a firm touch (not light) that the child can see approaching when putting an arm around his shoulders or patting his back in congratulations. Insist that the children leave a "thinking space" between them when standing in line. Encourage the child to tolerate the use of sand, clay and finger paints with sawdust mixed into it. You can also make finger paints out of Ivory Snow for easy clean up or chocolate pudding to enhance motivation. Tell your therapist about the tactile defensiveness so s/he can help normalize the tactile system.

Apraxia. One group of symptoms which Dr. Ayres identified she named apraxia. This is difficulty in the planning of new non-habitual movements. An apraxic adult would have difficulty perfecting a new swimming or tennis stroke. Some but not all Apraxic children

have difficulty learning new handwriting skills. Here is an example of the problems such a child has with coordinating what his eye sees with what kinesthetic and proprioceptive information come into his central nervous system from the movement of his joints, muscles, and tendons: write your own name in mirror image but starting with the end of the last letter e.g. begin → 

For the apraxic child, opportunities to motor plan are helpful--obstacle courses right in the classroom (especially with blankets to cover some of the obstacles), action songs like Inky Dinky Spider, and imitation games like "Did You Ever See a Lassie Go this Way and That."

Sometimes this difficulty in motor planning is related to a poorly functioning tactile system. If so, the tactile activities just mentioned could be helpful--sand, clay, finger paints--as well as identifying objects in a Feely Box and playing wrapped up mummy or wiggle worm.

Vestibular problems. In some apraxic children, the motor planning difficulty is related to a disorder of the vestibular system. This system has sensors located in the inner ear which pick up information about gravity, and our movements through space. This information plus input from muscle movements and eyes is understood and used by the central nervous system to help with motor planning.

This type of vestibular information is also often related to difficulty balancing. Several authors have observed and recommended treatment for balance problems in children with learning problems, for example Kephart, Barsh and Cratty. In addition, deQuiros, Ayres, Frank and Levinson, and Ottenbacher have connected these balance problems with deficits in the Vestibular System. Ayres speaks of "postural insecurity" in the L D children who have major difficulty responding appropriately to the pull of gravity. Behavior problems or inattention often result when L D children with poor balance cannot sit or stand without cognitively thinking about their postural adjustments. Teachers can use classroom break time or recess for balance activities such as hopping, skipping, broad jump, kicking or rope jumping. The occupational therapist deals with the vestibular basis for these problems and correct developmental sequences.

Bilateral Integration is also often a problem for the learning disabled, particularly those with vestibular disorders. You can encourage children to cross their midline (that hypothetical line from the center of their forehead to between their feet) by sorting and classifying objects into boxes across the midline or by throwing across the midline to mathematics or phonics targets. Those who have poor bilateral integration will need extra help with skipping, drawing a line with a ruler, or using the non dominant hand to hold

the paper still while writing. Sometimes each hemisphere of the brain seems to be processing information very differently and asymmetry results. At times one side of the body is particularly neglected--the child may consistently neglect the math problems on, say, the left side of his worksheet, or may consistently write with the left or right side of the page very crowded or very empty. One unilateral neglect child tended not to notice things on one side so would bump into them; then, because she was also tactually defensive, she usually overreacted behaviorally, lashing out with her fists at whoever she bumped into.

Eye hand Coordination is frequently a problem for the learning disabled especially if there is a significant tactile or vestibular system deficit. If you wore gloves to reduce the amount of touch information you were getting, could you still button the front of your shirt without looking? Try it. If you had a vestibular disorder associated with reduced muscle tone and less kinesthetic input from muscles, joints and tendons could you still take notes while looking at a lecturer or his slides? If a faulty vestibular system caused your eyes not to work smoothly together--like two ice cubes floating in a glass as Kephart puts it--could you still comprehend your reading while thinking about consciously aiming your eyes at the words? If these or other minimal brain dysfunctions cause

eye-hand coordination to need cognitive direction with alot of conscious effort, there is little energy left to direct toward thought processes for learning academics.

The therapist can help with the causes of some of these eye hand coordination problems and with teaching the self help skills often lacking in the young learning disabled student—tying shoes, zipping a snow coat, pouring juice for snack time. To help eye hand coordination while doing academic tasks one teacher writes math problems on the pie wedges of a paper plate and the children pinch onto it numbered clothespins around the edge to signify answers.

Form and Space Perception. Poor integration in the areas we've discussed so far often results in or is compounded by poor form and space perception--difficulty in visual perception, auditory localization, identifying objects by touch, environmental space confusion and/or poor time and sequencing sense. The therapist is alert to underlying sensory channels which contribute to these problems. They can also suggest teaching strategies to help the child compensate for these problems--for example, teaching the child to use cards to cover up portions of a confusing worksheet so he can deal with one part at a time, or teaching discrimination of oblique diamond lines through limb positioning or using pick-up sticks placed at various angles.

Language Disorders. Some L D children have language processing problems. Often these are seen in children who also have vestibular disorders according to deQuiros(7), and the therapist can treat the vestibular problem. Improvement in language skill following occupational therapy treatment using sensory integration was documented in one study by Ayres (3). Sometimes the language problem is fairly discreet without other sensory deficits, in which case the therapist defers to the expertise of the special educator and speech and language clinician.

This paper has focused on occupational therapy as an important form of treatment to augment special education for the learning disabled child. Sensory integration, developed by A. Jean Ayres and expanded by other therapists, was discussed with particular reference to problems of the tactile and vestibular systems. Classroom ideas for children with problems in tactible defensiveness, apraxia (motor planning), vestibular and bilateral integration, eye hand coordination and form and space perception were discussed.

The "occupation" of the learning disabled child consists of being a student, a family member, a neighborhood pal. The occupational therapist, along with other members of the educational team, is concerned with preparing the child for assuming these roles. While the special educator's job is to teach, the occupational therapist helps prepare the child to learn.

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